

Novel Methods for the Flexible Ultrasound System utilizing Augmented Reality Just-In-Time Procedural Guidance, Phase I

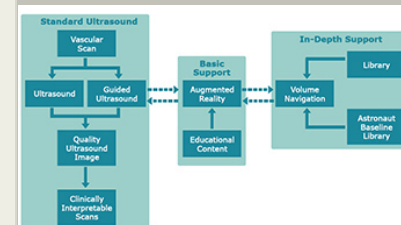
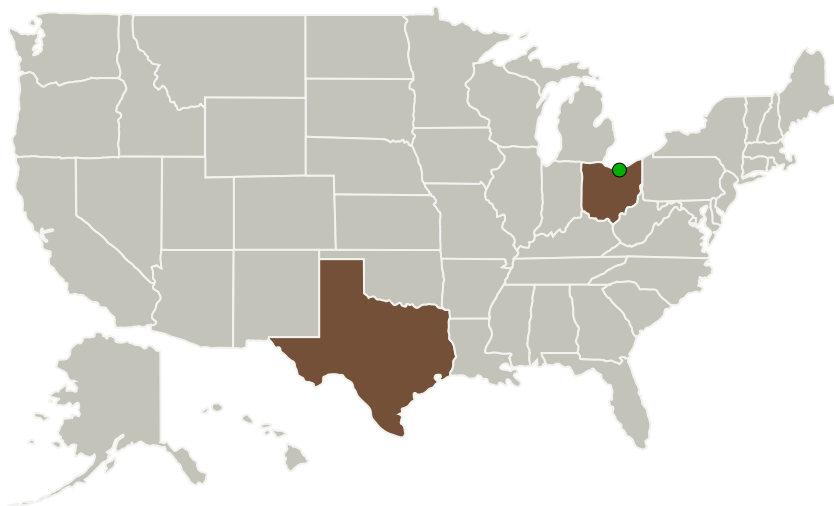
Completed Technology Project (2016 - 2016)



Project Introduction

NASA's future manned spaceflight missions will require medical diagnosis and treatment capabilities that address both the anticipated health risks and perform well in austere, remote operational environments. Spaceflight-ready medical devices will need to be capable of an increased degree of autonomous operation, acquiring clinically relevant and diagnosable data by every astronaut, not just select physician crew members credentialed in spaceflight medicine. Ultrasound is a diagnostic and treatment technology that currently fulfills mission medical capability support on ISS and is planned to accompany future deep-space missions. The Flexible Ultrasound System (FUS) is a new platform that is currently being developed by NASA and research partners to support this mission role. We propose three specific aims for this project proposal for methodological development utilizing the FUS platform: 1.) Develop and implement a group of vascular diagnostic methods related to health conditions on the Exploration Medicine Condition List (Carotid assessments, DVT, Cardiogenic shock, sudden cardiac arrest secondary to traumatic injury) and vascular access procedural guidance (central venous or arterial cannulation) utilizing the exposed API for the FUS platform 2.) Implement an Augmented Reality (AR) user interface for these vascular methods that provides procedural guidance in acquiring and initially diagnosing sonographic data for one or more ultrasound procedures to enhanced degree of procedural competency. 3.) Prototype the integration of Volume Navigation on the FUS platform to allow for 3-dimensional ultrasound procedural guidance through the Head Mounted Display.

Primary U.S. Work Locations and Key Partners



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Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Images	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

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Organizations Performing Work	Role	Type	Location
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Ohio	Texas

Project Transitions

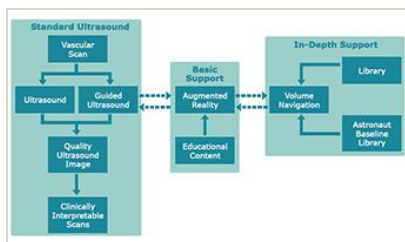
▶ **June 2016:** Project Start

✔ **December 2016:** Closed out

Closeout Documentation:

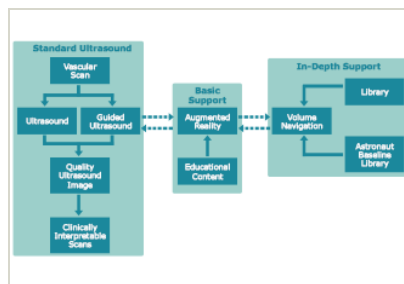
- Final Summary Chart(<https://techport.nasa.gov/file/139901>)

Images



Briefing Chart Image

Novel Methods for the Flexible Ultrasound System utilizing Augmented Reality Just-In-Time Procedural Guidance, Phase I (<https://techport.nasa.gov/image/136068>)



Final Summary Chart Image

Novel Methods for the Flexible Ultrasound System utilizing Augmented Reality Just-In-Time Procedural Guidance, Phase I Project Image (<https://techport.nasa.gov/image/128466>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

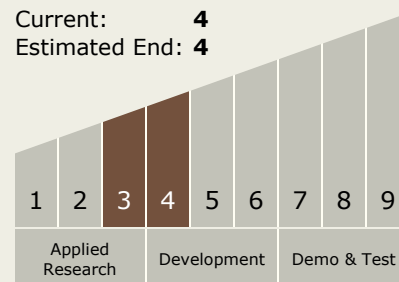
Carlos Torrez

Principal Investigator:

William Buras

Technology Maturity (TRL)

Start: 3
Current: 4
Estimated End: 4



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Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - └ TX06.3 Human Health and Performance
 - └ TX06.3.1 Medical Diagnosis and Prognosis

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System